

Georgia Southern University

Digital Commons@Georgia Southern

Public Health Syllabi

Public Health, Jiann-Ping Hsu College of

Fall 2016

BIOS 9130 - Research Seminar in Biostatistics

Hani Samawi

Georgia Southern University, Jiann-Ping Hsu College of Public Health, hsamawi@georgiasouthern.edu

Follow this and additional works at: <https://digitalcommons.georgiasouthern.edu/coph-syllabi>



Part of the [Public Health Commons](#)

Recommended Citation

Samawi, Hani, "BIOS 9130 - Research Seminar in Biostatistics" (2016). *Public Health Syllabi*. 71.
<https://digitalcommons.georgiasouthern.edu/coph-syllabi/71>

This other is brought to you for free and open access by the Public Health, Jiann-Ping Hsu College of at Digital Commons@Georgia Southern. It has been accepted for inclusion in Public Health Syllabi by an authorized administrator of Digital Commons@Georgia Southern. For more information, please contact digitalcommons@georgiasouthern.edu.

GEORGIA SOUTHERN UNIVERSITY

Jiann-Ping Hsu College of Public Health

BIOS 9130—Research Seminar in Biostatistics

Fall 2016

Instructor: Hani M. Samawi
Office: 1006 Hendricks Hall
Phone: 478-1345
E-Mail Address: hsamawi@georgiasouthern.edu
Office Hours: Tuesdays and Thursdays: 1:00 - 2:00 PM;
Monday 1:00-4:00 PM and by appointment

Web Page: Yes
Class Meets: TR – 2:00 pm-to-3:45 pm (Info Technology Bldg 2203)

-- Course schedules can be found at: https://wings.georgiasouthern.edu/pls/WINGS-PROD/ywskclas.P_CrseSearch

Prerequisites: NA http://www.ats.ucla.edu/stat/sas/notes_old/movies/IntroSAS1.html
<http://www.scs.unr.edu/~richmon4/richmondstats.htm>

Course Credit: This is a three-credit hour course designed for the DrPH core curriculum.

Course Structure: This course is an in-person meeting class.

Catalog Description: This course is designed to provide the student with the current best practices in biostatistical consulting. Topics include: Identifying and constructing appropriate questions to ask clients regarding their consultation request, an overview of appropriate statistical methods and SAS software procedures to use for specific study designs and statistical analysis of collected data, directing a consultation appointment without faculty lead, conducting exploratory data analyses, conducting effective analyses based on appropriate statistical methods, conducting needed simulation (including Monte Carlo methods and Bootstrap methods) and providing oral and written communication of statistical findings. 3 credit houses

Required Textbook: Javier Cabrera Andrew McDougall A. McDougall (2002). Statistical Consulting. Springer

- Secondary Textbook:**
- 1- Janice Derr (2000). Statistical Consulting A Guide to Effective Communication, 1st Edition. Duxbury Press.
 - 2- Byron J. T. Morgan (1984) Elements of Simulation. Chapman and Hall, New York.
 - 3- Efron, Bradely (1982). The Jackknife, the Bootstrap and other Resampling Plans.

Dr.PH Core Student Learning Outcomes (CORE)

At the end of the Dr.Ph program, the students will be able to:

1. Demonstrate their readiness to work with communities to address public health problems.
2. Select and apply theoretically based interventions to address public health problems.
3. Apply appropriate research methods to address community health problems, particularly among rural and underserved populations.

Dr.PH Biostatistics Concentration Student Learning Outcomes

At the end of Dr.PH program, students will be able to:

1. Construct a public health and biomedical research questions from ideas, conditions, and events that exist in a rural and urban community, region, state, and nation using critical thinking skills.
2. Demonstrate required skills for translating public health practice objectives to appropriate biostatistical framework for analysis and interpretation of results
3. Illustrate sufficient substantive knowledge of advanced biostatistical methods such as multiple regression, logistic regression, survival analysis, longitudinal data analysis, and Bayesian and adaptive methods to interact with biostatisticians and related public health researches in a meaningful and productive fashion. .
4. Communicate biostatistical principles and concepts to lay and professional audiences through both oral and written communication.

Dr.P.H Biostatistics Concentration Competencies:

Upon graduation a student with a Dr.P.H. in Biostatistics should be able to:

1. Design a public health and biomedical investigation in terms of the experimental design, data to be collected that reflect research objectives, number of subjects needed, and specification of appropriate methods for analysis.
2. Analyze public health and biomedical data using appropriate statistical software such as SAS, R and S-plus.
3. Interpret analytic methods used in the public health and biomedical journals, as well as critique published reports of public health and biomedical experiments as to the validity of the inferential conclusions.
4. Develop new biostatistical methods and new ideas for applying existing biostatistical methods to applications in public health and the biomedical sciences.
5. Develop written and oral reports to communicate effectively with research investigators the pivotal aspects of a study, including: design, study objectives, data analysis methodology, results and conclusions.
6. Create a collaborative environment for working on written and oral reports.

Course Performance Based Objectives: At the completion of this course the student will be able to:

1. Identify the history of science and the role of statistics, the scientific method, statistical consulting environments and the role of the statistician within a scientific environment. (Competencies 1)
2. Understand how to communicating with researchers from other areas, do report writing. (Competencies 3, 5, 6)
3. Distinguish between the statistical methods that will be used in the statistical consultation and of the computational tools and statistical software such as SAS and S-PLUS that are available. (Competence 2)
4. Identify the need of the prior information and the financial issues and the concept of the first meeting. Manage the necessary documentation. Project analysis. Presenting the results. Writing the final report. (Competences 5 and 6)
5. List the details of case studies and illustrate the presentation format of case studies. (Competence 6)
6. Design and conduct simulation study including, how to generate random numbers from different distribution, Monte Carlo methods of approximation and Bootstrap methods of estimations. (Competence 4)

Assessment of students Learning

Activity 1: Use course lectures and class discussions to explain the basic terminology and definitions of history of science and the role of statistics, the scientific method, statistical consulting environments and the role of the statistician within a scientific environment. Competence in basic terminology will be evaluated using one activities: (1) Weekly Class discussion

Activity 2: Use course lectures, class discussions, class notes, and life experience to understand how to communicate with researchers from other areas, to do report writing, to distinguish between the statistical methods that will be used in the statistical consultation and of the computational tools and statistical software such as SAS and S-PLUS that are available. Moreover, to identify the need of the prior information of the financial issues, the concept of the first meeting, manage the necessary documentation, project analysis, presenting the results and writing the final report. The competence in statistical consultation will be evaluated using two activities: (1) Analyzing, presenting and writing a report of an existing case study from A-Z. (2) Life statistical consulting cases: The students will do a life statistical consultation from A-Z.

Activity 3: Use course lectures and class discussions to understand how to design and conduct simulation study including, how to generate random numbers from different distribution and how to perform Monte Carlo methods of approximation and Bootstrap methods of estimations. Competences in ability to conduct simulation studies will be evaluated using two activity (1) Using challenging simulation problem (2) Write a report and present the simulation results.

Overview of the Content to be Covered During the Semester:

Week	Topic	Readings	Assignment: Due within 1 week of completion of topic
1	Introduction and organization of the course. (Learning Objectives: 1)	Text , Chapter 1	To be announce in the class
2	Communicating with researchers from other areas. Report writing. (Learning Objectives: 2)	Text , Chapter 2	To be announce in the class
3-4	Methodological aspects (Learning Objectives: 3)	Text , Chapter 3, Appendix B	To be announce in the class
5-6	A consulting Project from A-Z (Learning Objectives: 4)	Text , Chapter 4	To be announce in the class
7	Introduction to Case Studies (Learning Objectives: 5)	Text , Chapter 5	To be announce in the class
9-10	Case Studies (Group I) (Learning Objectives: 6)	Text , Chapter 6	To be announce in the class
11-12	Case Studies (Group II) (Learning Objectives: 7)	Text , Chapter 7	To be announce in the class
13-14	Case Studies (Group III) (Learning Objectives: 8)	Text , Chapter 8	To be announce in the class
14	Random Number generating (Learning Objectives: 9)	Morgan, Chapters 1, 2, 3, 4	To be announce in the class
15	Monte Carlo method of approximation (Learning Objectives: 10)	Morgan, Chapters 5, 6	To be announce in the class
16	Bootstrap methods (Learning Objectives: 11)	Class notes	To be announce in the class

Samples of your work may be reproduced for search purposes and/or inclusion in the professor's teaching portfolio. You have the right to review anything selected for use, and subsequently ask for its removal.

Instructional Methods: Class meetings will be a combination of lecture, class discussion, and computer software demonstration. Written homework assignments and examinations constitute the basis of student evaluation.

**Exam Schedule and
Final Examination:**

Midterm Examination Case Study presentation October 18
2016
Final Examination: December 6, 2016 Simulation Project
Presentation.

Grading:

Weighting of assignments for purposes of grading will be as
follows:

Midterm Exam (30%)	(Learning Objectives: 1-6)	100 points
Final Exam (40%)	(Learning Objectives: 1-14)	100 points
Assignments (30%)	(Learning Objectives: 1-11)	300 points

Total Possible Points
500 points (100%)

The following point scale will be utilized in grading:

450-to-500 points (90%) A
400-to-449 points (80%) B
350-to-399 points (70%) C
300-to-349 points (60%) D

A cumulative total of 299 points or less will be considered as
failing.

For calculation of your final grade, all grades above will be
included.

Your grades **will not** be posted. All exams and assignments
will be graded and returned promptly so that students may
accurately calculate their grades at any point in time during the
semester.

There are times when extraordinary circumstances occur (e.g.,
serious illness, death in the family, etc.). In such
circumstances, and/or if you need additional time to
satisfactorily complete any course requirement, please consult

with the instructor within a reasonable amount of time. *Nota Bene:* Extensions are not guaranteed and will be granted solely at the discretion of the instructor.

NO EXTRA CREDIT PROJECTS WILL BE ASSIGNED!

Academic Misconduct: As a student registered at this University, it is expected that you will adhere to only the strictest standards of conduct. It is recommended that you review the latest edition of the *Student Conduct Code* book, as well as the latest *Undergraduate & Graduate Catalog* to familiarize yourself with the University's policies in this regard. Your continued enrollment in this course is an implied contract between you and the instructor on this issue; from this point forward, it is assumed that you will conduct yourself appropriately.

Academic integrity relates to the appropriate use of intellectual property. The syllabus, lecture notes, and all materials presented and/or distributed during this course are protected by copyright law. Students are authorized to take notes in class, but that authorization extends only to making one set of notes for personal (and no other) use. As such, students are not authorized to sell, license, commercially publish, distribute, transmit, display, or record notes in or from class without the express written permission of the instructor.

Academic Handbook: Students are expected to abide by the Academic Handbook, located at <http://students.georgiasouthern.edu/sta/guide/>. Your failure to comply with any part of this Handbook may be a violation and thus, you may receive an F in the course and/or be referred for disciplinary action.

University Calendar for the Semester: The University Calendar is located with the semester schedule, and can be found at:
<http://www.collegesource.org/displayinfo/catalink.asp>.

Attendance Policy: Federal regulations require attendance be verified prior to distribution of financial aid allotments. Attendance will not be recorded after this initial period.

One Final Note: The contents of this syllabus are as complete and accurate as possible. The instructor reserves the right to make any changes necessary to the syllabus and course material. The instructor will make every effort to inform students of changes as they occur. It is the responsibility of the student to know what

changes have been made in order to successfully complete the requirements of the course.